

Self-efficacy and doctor support as mediators of depression outcomes following counselling by family doctors for intimate partner violence

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Self-efficacy and doctor support as mediators of depression outcomes following counselling by family doctors for intimate partner violence

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Self-efficacy and doctor support as mediators of depression outcomes for IPV survivors

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Key messages

- Doctor-delivered counselling for IPV survivors led to better perceived support
- Counselling also resulted in greater self-efficacy at one-year timepoint
- Greater levels of support and self-efficacy mediated reduced depression

Abstract

Background

Previous research shows counselling delivered by trained family doctors reduces depression for women experiencing intimate partner violence. However, the potential for self-efficacy, doctor support and safety enquiry to mediate these effects has not been examined.

Objectives

To assess whether a) women experiencing intimate partner violence and counselled by a trained family doctor report greater self-efficacy, perceived doctor support and enquiry about safety than those receiving usual care; and b) self-efficacy, doctor support and enquiry mediate effects of counselling on depression for these women.

Methods

Quantitative analysis as part of a process evaluation of data from a cluster randomised controlled trial of 272 female intimate partner violence survivors attending 52 Australian primary care clinics. Intervention group doctors were trained to deliver brief counselling. Comparison group doctors received standard intimate partner violence information. Intervention patients were invited to receive counselling from their trained doctor. Comparison patients received usual care. Data were collected at baseline, six, and twelve months. Path analysis tested mediation effects from trial arm to depression via self-efficacy, doctor support and safety enquiry at six and twelve months, controlling for baseline and abuse level.

Results

At six months, mean perceived doctor support was higher for intervention than comparison patients, and mediated depression effect. At twelve months, mean self-efficacy was higher for intervention than comparison patients and mediated depression effect. Mediation effects for doctor enquiry were non-significant.

Conclusions

Counselling by trained family doctors can help increase support and self-efficacy of women who have experienced intimate partner violence, mediating reduced depression.

Key words

Counselling

Depression

General practice

Intimate partner violence

Primary health care

Self-efficacy

Introduction

Globally, one in four women experiences intimate partner violence (IPV) at some stage in her lifetime (1). This is of high relevance to health practitioners, given evidence shows IPV contributes at least as high a health burden to women of child-bearing age as raised blood pressure, tobacco use and obesity (2). Women experiencing IPV are at substantially increased risk of physical and psychological health damage, including depression, anxiety, chronic pain, gynaecological and general health issues (1). Family doctors are often the first or only point of contact for women experiencing IPV, and it is imperative they have the training and referral pathways in place to support patients who disclose or are identified as experiencing IPV (3). The World Health Organization (4), the United States Preventive Taskforce (5), and the National Institute for Health and Care Excellence (6) all recommend woman-centred care as a first line response following identification or disclosure of IPV. However, there have been limited trials to further guide family doctors regarding care they should offer women experiencing IPV (3, 7). Furthermore, there have been very few process evaluations of IPV trials to assess mechanisms through which successful interventions operate.

A landmark cluster randomised controlled trial (RCT), WEAVE, evaluated the impact of training family doctors in primary care settings to provide counselling for patients experiencing IPV (8-10). Women in the intervention group reported increased enquiry about women's safety and decreased depressive symptoms, both pre-specified as secondary outcomes (9). Although pre-specified effect sizes for primary outcomes (quality of life and safety planning) were not obtained, secondary outcome effects were deemed important, especially given depression can

have wide-ranging implications (11). Meta-analyses have shown strong associations between IPV and depression (12, 13). These associations can be in either direction, with IPV potentially leading to depression, and depression increasing risk of IPV victimisation (12, 13). Depression may adversely impact an individual's capacity to recognise abuse, keep themselves and their children safe, and ultimately escape the abuse.

The Realistic Evaluation model was used to guide a series of process evaluations of the WEAVE trial (10, 14-18). This model focuses on exploring how outcomes are produced and under what circumstances, by examining context, mechanisms and outcome patterns of the trial (14). For a list of previous WEAVE process evaluation papers see Supplement. The current paper is the next in this series of process evaluations, focusing on the intermediate mechanisms through which the WEAVE counselling intervention reduced depressive symptoms for patients experiencing IPV. Elucidating processes by which an intervention results in improved outcomes is essential for guiding successful replication or upscaling of interventions (19-21). One way of investigating intermediate processes is through use of path analysis incorporating mediation effects (22). This quantitative approach to process evaluation is underutilised, as process evaluations often focus on qualitative or univariate methodologies (22).

Increased self-efficacy and perceived support are two variables which have contributed to or mediated reduced depression in studies with other patient groups (23-25). The Psychosocial Readiness Model (26) also identifies survivors' perceptions of support, self-efficacy and readiness to change as factors that may influence positive outcomes for IPV survivors. Based on this Model (26), the WEAVE trial hypothesised that brief counselling by trained doctors would

increase women's perception of support and lead to positive changes in self-efficacy and readiness to change, and that these 'internal' changes would collectively lead to reduced depression (10). Here, we aim to assess a) whether brief counselling delivered by family doctors increases self-efficacy and perceived doctor support among women who experienced IPV and b) whether self-efficacy, doctor support and safety enquiry mediate reduced depressive symptoms for these women.

Method

Study design and participants

The WEAVE study was a cluster RCT in Victoria, Australia, involving 52 family doctors (at separate clinics) and 272 female patients who experienced fear of a partner in the past twelve months (9, 10). Participants were eligible if they were aged 16 to 50 years, attended the study doctor in the past 12 months, and reported feeling afraid of their partner or ex-partner in the past 12 months in a health screening survey sent to all of the doctors' female patients (9, 10). The trial conformed to CONSORT guidelines and was approved by The University of Melbourne's Human Research Ethics Committee. Full details of the trial are published elsewhere, including CONSORT flow diagram, sample size calculations, participant characteristics, and primary outcomes (9, 10). Participant characteristics were similar across intervention and comparison arms (9). Mean patient age was 37.9 (SD = 8.8) in intervention and 39.1 (SD = 7.3) in comparison group. One-hundred-and-forty-four (53%) patients lived with a partner, 159 (59%) had a child under 18 living with them, 199 (70%) were employed at least part-time, 61 (23%)

received a government pension as their main source of income, and 257 (94%) spoke English as their first language (9).

As described elsewhere (9), 25 doctors were randomly allocated to the intervention and 27 doctors to the comparison arm. Their patients were also allocated to the corresponding arm, resulting in 137 women in the intervention and 135 in the comparison arm. In brief, doctors in the intervention group participated in “Healthy Relationships” training designed to help them deliver a brief, woman-centred counselling intervention to women fearful of a partner (8).

Following randomisation, women in the intervention group were invited to attend up to six sessions of brief counselling for relationship and emotional issues by their trained doctor at no cost (9). The counselling included listening, validating women’s experiences and feelings, assessing safety and readiness for change, and supporting decision-making to improve self-efficacy (8). Doctors in the comparison group received a basic IPV information pack and delivered care as usual. All participants received a list of relevant resources. Sixty-seven (49%) intervention group women attended at least one WEAVE counselling session (see Supplement for further details).

Measures and data collection

Data were collected from patients via postal surveys at baseline, six and twelve months, as described in detail elsewhere (9).

1. Depression was measured using the Hospital Anxiety and Depression Scale (HADS) (27), which consists of seven items to measure depression and seven to measure anxiety.

Items are self-reported on a four-point Likert scale from zero to three. Total depression scores can range from zero to 21. Scores greater than seven represent possible depression.

2. Self-efficacy was measured using the General Self-Efficacy Scale (GSES) (28), which consists of 10 items, self-reported on a four-point Likert scale from one to four. Total self-efficacy scores range from 4 to 40.
3. Perceived doctor support was assessed by asking participants to mark to what degree they felt supported by the doctor on a visual analogue scale ranging from 0 (completely unsupported) to 100 (completely supported).
4. Patients were asked whether the trial doctor enquired about their safety during the past six months (yes / no).
5. Severity of IPV was included in these analyses as a control variable, as IPV could influence depressive symptoms, doctor enquiry and self-efficacy. Severity of IPV was measured using the Composite Abuse Scale (CAS) (29). The CAS asks respondents to rate how often they experienced 30 IPV behaviours indicative of physical abuse, emotional abuse, harassment, or severe combined abuse. Item responses range from 0 (never) to 5 (daily). Total CAS scores can range from 0 to 150.

Data analysis

Path analyses were conducted using full information maximum likelihood estimation with robust standard errors in MPlus Version 7 (30). Main analyses followed intention-to-treat principles, including all available data from all participants, including intervention group participants who did not attend counselling. However, supplementary subgroup analyses were also conducted to assess effects when excluding intervention group participants who did not attend counselling.

(Supplement). Across all analyses, missing data was assumed to be missing at random and handled within the full information maximum likelihood model. Trial arm (intervention versus comparison) was entered as the predictor variable. Depression scores at six and twelve months were entered as outcome variables. Self-efficacy, perceived doctor support, and doctor enquiry about safety at six and twelve months were entered as proposed mediators. Analyses adjusted for women attending same doctor (cluster effect) and rural versus urban stratification. Analyses also controlled for level of abuse at each time-point, and for baseline levels of depression, perceived doctor support, and doctor enquiry. A baseline measure of self-efficacy was not collected and was therefore unable to be included in the model. Given prior research shows an association between self-efficacy and depression (31, 32), depression was used as a proxy control variable for self-efficacy. Baseline depression was also the control variable for depression outcomes. Total, direct and indirect effects were calculated for each potential pathway in the model. The model was refined by excluding mediation paths that made no statistically significant contribution to the model, and by assessing fit indices. Fit indices assessed included Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker Lewis index (TLI) (33). RMSEA values below .06 and CFI and TLI values above .90 were regarded as providing good model fit (33). It should be noted that indirect mediation effects are routinely of smaller magnitude than direct effect sizes, and this magnitude cannot be assessed in the same manner as direct effects (34).

To test mediation effects, paths from mediators to outcomes needed to be specified as unidirectional paths (22, 35). A priori predictions based on the Psychosocial Readiness Model (26), outlined in the introduction, determined directionality of paths tested (8, 10). Modelling

paths in this direction was also consistent with the process evaluation aims of the study, as we were primarily interested in explaining variance in the depression outcomes. Feedback loops were unable to be tested as part of the final model due to ratio of participants to parameters being too low for this level of complexity. As an alternative, for each mediation path found, separate ad hoc analyses were undertaken to test reverse paths.

Results

The six-month survey was completed by 94/137 intervention and 99/135 comparison women. The twelve-month survey was completed by 96/137 intervention and 100/135 comparison women. Flow of participants through the trial, and reasons for non-return of surveys, are described elsewhere (9). Table 1 shows rates of complete and missing data for each variable of interest in path analyses, along with baseline, six-month and twelve-month descriptive statistics for each variable. Figure 1 shows mediation paths that contributed to reduced depression at six and twelve months. Table 2 shows the total, direct and indirect effects for these paths. Safety enquiry at 6 months was also retained in the model due to its contribution to a statistical suppression effect, explained in Supplement (35). The final model (Figure 1) showed very good fit (RMSEA = .046; CFI = .962; TLI = .944) (33) and explained 42.1% of variance in depressive symptoms at six months, and 59.6% of variance in depressive symptoms at twelve months.

[TABLE 1 HERE]

[FIGURE 1 HERE]

[TABLE 2 HERE]

At six months, perceived doctor support was higher for women in the intervention than comparison group (see Table 1 and path *b* in Figure 1 and Table 2). The standardised coefficient for this association was of moderate magnitude (Table 2) (33). Higher perceived doctor support was, in turn, associated with lower depression at six months, again with a standardised coefficient of moderate magnitude (see path *e*, Figure 1 and Table 2). Ad hoc analyses showed no significant effect in the opposite direction ($B [SE] = 0.32 [0.53]$, $\beta = .04 [.07]$, $p = 0.547$). The indirect mediation effect from group assignment to depression via perceived support was statistically significant (see path $b * e$ in Figure 1 and Table 2). In other words, at six months, the lower depression experienced by the intervention group could be partially explained by higher doctor support, when compared to the comparison group, although direct causation cannot be inferred. Doctor support at six months continued to have a mediation effect on depression at twelve months, via its relationship with depression at six months (see path $b * e * i$, Figure 1 and Table 2). At twelve months, perceived doctor support was excluded from final model, as there was no significant difference between groups on this variable at this time-point, when using intention-to-treat analyses (see Table 1; mean difference, controlling for baseline = -0.69, SE = 3.71, $p = .852$; see Supplement for supplementary findings).

At six months, more women in the intervention group were asked by the WEAVE doctor about their safety than women in comparison group (see Table 1 and path *c* in Figure 1 and Table 2). Doctor enquiry acted as a suppressor variable in the model (see Supplement for explanation).

Controlling for this suppression effect required specification of a unidirectional path from doctor enquiry to depression in the model, rather than free estimation of a bidirectional path (35) (Supplement). Although the unidirectional path did not reach statistical significance, its inclusion was necessary to allow clear estimation of the direct effect between doctor support and depression (Supplement). The difference between groups on doctor enquiry continued at twelve months (see Table 1). However, this path at twelve months did not contribute to mediation or suppression effects and therefore was not retained in the model.

At twelve months, mean self-efficacy scores were higher for women in the intervention than comparison group, and the standardised coefficient for this association was of moderate magnitude (see Table 1 and path *d*, Figure 1 and Table 2). Higher self-efficacy scores were, in turn, moderately associated with lower depression (see path *g*, Figure 1 and Table 2). Self-efficacy mediated the effect from group to depression at twelve months, as indicated by a significant indirect effect (see path *d*g*, Figure 1 and Table 2). In other words, at twelve months, higher self-efficacy associated with the intervention could partially explain lower depression experienced by the intervention group. It should be noted, however, that this effect may be bidirectional, and that causation cannot be inferred. Ad hoc analyses also showed a significant path from depression to self-efficacy at 12 months ($B [SE] = -0.73 [0.11]$, $\beta [SE] = -.56 (.08)$, $p < .001$). The indirect mediation effect from group to self-efficacy via depression at twelve months was also statistically significant ($B [SE] = 0.90 [0.36]$, $\beta [SE] = .15 [.06]$, $p = .012$). At six months, self-efficacy was excluded from the model, as there was no significant difference between groups on this variable at this time-point (see Table 1; mean difference $[SE] = 0.69 [0.84]$, $p = .416$).

Discussion

This process evaluation study of a landmark RCT of brief counselling for IPV found that a woman's perception of the support received from her family doctor and her level of self-efficacy play a mediating role in reducing depressive symptoms. Firstly, relative to the comparison group, women in the intervention group felt more supported by the WEAVE doctor at six months and had higher mean self-efficacy scores at twelve months. Both variables were targeted as part of an a priori pathway to improved depression. These group differences mediated the lower depression scores for intervention group women observed at 6 and 12 months, although unidirectional causation cannot be inferred. Although more intervention than comparison women were asked about their safety by their family doctor at six and twelve months, this enquiry did not directly mediate depression outcomes. The overall findings of this process evaluation are consistent with the WEAVE trial hypothesis that an intervention focused on providing support and enhancing self-efficacy for women would facilitate improved mental health, in this case improved depression (10, 36).

Doctors in the intervention arm of the WEAVE trial were trained to engage in active listening, inquiring about needs, validating experiences, enhancing safety and supporting decision-making, along with other aspects of patient-centred care (8). The current findings suggest this approach was more effective than usual care in helping women feel supported by the doctor, particularly during the six-month timeframe in which intervention women were invited for counselling.

Intervention group women who attended counselling continued to feel more supported than the control group at twelve months (Supplement).

The mediating effect doctor support had on depression at six-months is consistent with prior research in other patient groups, which show perceived support from a therapeutic relationship can help alleviate depression (24). A mixed-methods process-evaluation regarding which intervention group patients attended WEAVE counselling sessions and why, showed that good doctor communication and supportiveness can also help patients feel comfortable attending brief relationship counselling in the first place (17). Thus, the benefits of enhancing doctor supportiveness may be two-fold, both encouraging IPV survivors to attend brief relationship counselling, and helping facilitate improved depression outcomes when they do. It should be noted, however, that the effect size for the association between doctor support and depression at six months was small, and that this association did not continue at twelve months, even for women who attended the counselling. Counselling was only offered during the first six months post-baseline, thus any impact related support had on depression may have attenuated by the twelve-month timepoint.

The relationship at twelve months between patient-centred counselling and increased self-efficacy, and between increased self-efficacy and reduced depression, is also consistent with prior research in other patient groups (23, 25). An explanation for the reduced depression via self-efficacy is that believing in one's ability to change a situation may circumvent intrusive traumatic thoughts, replacing them with a sense of having the capacity to change the situation (23). This is of particular importance in relation to IPV, given survivors often experience a lack

of control and a sense of powerlessness and hopelessness, as the perpetrator engages in continued efforts to undermine the survivor's confidence and agency (37). Improvements in self-efficacy and depression may help a survivor gain agency in preparing for, implementing or maintaining their goals (38). Improved doctor support, enquiry about safety and self-efficacy may also have wider positive consequences, beyond those measured in the WEAVE trial (23, 39).

Further research is needed to explore why the effect for self-efficacy was significant at twelve months but not six months. One possible explanation is that self-efficacy may have taken some time to fully develop following the counselling invitation (38). This explanation would be consistent with theories of self-efficacy development, given initial steps toward desired change can be a catalyst for increased self-efficacy over time, facilitating a person's belief in their ability to mobilise even further change (23, 39). In the case of IPV, this change could include, for example, putting parts of a safety plan into action, seeking out additional supports, or practicing strategies to reduce intrusion of traumatic memories; actions which intervention group doctors were trained to support (8). It could take participants time to put their desired actions into place, and for these actions to facilitate further self-efficacy development. This possible explanation is difficult to fully assess, given the self-efficacy measure was not collected at baseline. Future research could further explore temporal and contextual aspects of self-efficacy development following counselling for IPV survivors.

One challenge in interpreting these self-efficacy findings is that there is little prior literature available to assess how clinically meaningful the difference found is, in other words, whether

this difference would have a real impact on the lives of IPV survivors. Nonetheless, clinical expectations can be guided by converting the standardised effect size into a “number needed to treat” (NNT) value (40), and by examining how the mean difference between groups could translate into GSES responses. The standardised difference between groups on self-efficacy at 12 months was around a third of a standard deviation (Cohen’s $d = \beta = 0.32$). Conversion to NNT, shows we would expect to invite six patients for counselling in order to have one more success (where success is defined as having a better self-efficacy score than a randomly selected patient receiving usual care) (40). Examination of GSES content suggests that the two-point mean adjusted score difference between groups could have possible real-life implications for an IPV survivor’s wellbeing (see further explanation in Supplement). The mediating effects of self-efficacy on depression (and of depression on self-efficacy), also suggest this difference may have some clinical relevance. However, a great deal more research is needed to test thresholds for clinical meaning of GSES score differences.

Overall limitations of the WEAVE trial have been discussed elsewhere (9, 17). However, there are some additional limitations specific to these analyses. The stratified and clustered nature of the current data set limited the complexity of paths that could be estimated in the current model. Future studies may be able to explore these paths further, using larger sample sizes, and alternative sampling methods. Supplementary, ad hoc subgroup analyses undertaken in this study showed somewhat higher effect sizes when excluding women in the intervention group who did not attend counselling. This suggests overall effects of the intervention were attenuated by low uptake of counselling intervention sessions. Larger sample sizes would also allow effects to be examined by number of counselling sessions attended, and additional subgroup analyses to be

performed. An interview-based process evaluation of WEAVE identified several barriers that prevented some women attending counselling sessions, and these could be addressed in future research (17). Further research could also focus on whether women benefit from follow-up counselling sessions, or other interventions that target improvements in self-efficacy. As the current sample had a low proportion of unemployed women and primarily included women who spoke English as their first language, further research is needed to assess whether the results of this study can be generalised to more culturally and linguistically diverse groups. The IPV field urgently needs process evaluations alongside further trials in primary care as currently the number of trials are few (7).

The process evaluation analysis presented here adds to the dearth of research on the mechanisms through which complex interventions operate, particularly in the IPV field (7, 41). The current findings show that raising practitioner supportiveness and patient self-efficacy should be important components of interventions targeting improved depression for women experiencing IPV. Interventions that do not focus on these variables may be less effective in achieving reduced levels of depression, especially in primary health care settings. The Psychosocial Readiness Model (26) can provide a sound theoretical framework for developing IPV interventions, given its focus on support and self-efficacy, along with awareness, and is currently being used in an online healthy relationship and safety decision aid trial (42).

In conclusion, these findings suggest that woman-centred counselling delivered by family doctors trained to respond to IPV can help a survivor feel supported by their doctor and increase their self-efficacy over time. The findings also suggest that these changes mediate a reduction in

depressive symptoms of women experiencing IPV. IPV interventions which aim to improve depression outcomes should therefore include an emphasis on enhancing practitioner supportiveness and patient self-efficacy. Given the high prevalence of IPV among female primary care patients, family doctors have an important role in reducing the mental health burden associated with IPV, and facilitating a patient's sense of support and agency.

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Table 1. Data completeness and descriptive statistics for doctor enquiry, depression, perceived support from doctor, self-efficacy and Composite Abuse Scale for women experiencing fear of a partner or ex-partner enrolled in the WEAVE trial (n = 272).

	Intervention				Comparison			
	n missing	n complete	n	(%)	n missing	n complete	n	(%)
Doctor enquiry about safety								
Baseline	1	136	17	(12.50)	2	133	19	(14.29)
6 months	44	93	30	(32.26) ^a	39	96	12	(12.50) ^a
12 months	43	94	19	(20.21) ^b	36	99	11	(11.11) ^b
	n missing	n complete	Mean	(SD)	n missing	n complete	Mean	(SD)
Depression								
Baseline	1	136	7.21	(4.31)	1	134	7.65	(4.20)
6 months	43	94	6.15	(5.02)	37	98	6.95	(4.27)
12 months	41	96	6.19	(4.73)	36	99	7.63	(4.65)
Perceived support from doctor								
Baseline	5	132	58.01	(28.90)	5	130	60.90	(27.20)
6 months	51	86	50.26	(38.50)	43	92	35.35	(34.92)
12 months	44	93	63.70	(31.08)	39	96	67.13	(27.47)
Self-efficacy								
6 months	44	93	29.27	(5.99)	42	93	28.58	(5.52)
12 months	41	96	30.17	(6.07)	37	98	28.50	(6.10)
Composite Abuse Scale								
Baseline	2	135	20.99	(21.60)	3	132	18.49	(17.72)
6 months	44	93	12.89	(17.71)	41	94	11.38	(15.68)
12 months	44	93	13.68	(21.91)	39	96	10.01	(14.06)

Note. Doctor enquiry about safety = whether trial doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no; denominator includes all women who returned the survey, even if they had not visited the trial doctor in the past 6 months); Perceived support from doctor = how supported woman felt by trial doctor in the past six months (rated on visual analogue scale from 0 to 100); Self-efficacy = General Self-Efficacy Scale score (not measured at Baseline); Depression = Depression score on Hospital and Anxiety Depression Scale.

^aWhen denominator only includes women who attended trial doctor between baseline and six months: Intervention = 44.12%, Comparison = 18.03%; When numerator also includes women who told the doctor about their safety without first being asked: Intervention = 46 (71.88%), Comparison = 21 (33.87%). ^bWhen denominator only

includes women who attended trial doctor between six and twelve months: Intervention = 30.16%, Comparison = 18.64%; When numerator also includes women who told the doctor about their safety without first being asked: Intervention = 36 (56.25%), Comparison = 23 (38.98%).

Table 2. Total, direct and indirect effects from trial group (intervention or comparison) to depression at six and twelve months for women experiencing fear of a partner or ex-partner enrolled in the WEAVE trial (n = 272)^a

Path	Total effect			Direct effect			Indirect effect		
	B (SE)	β (SE)	p	B (SE)	β (SE)	p	B (SE)	β (SE)	p
a: Support (6m) \leftrightarrow Enquiry (6m)	2.60 (0.57)	.51 (.07)	<.001	2.60 (0.57)	.51 (.07)	<.001	-	-	-
b: Group \rightarrow Support (6m)	15.59 (4.76)	.43 (.13)	.001	15.59 (4.76)	.43 (.13)	.001	-	-	-
c: Group \rightarrow Enquiry (6m)	0.20 (0.04)	.48 (.10)	<.001	0.20 (0.04)	.48 (.10)	<.001	-	-	-
d: Group \rightarrow Self-efficacy (12m)	1.95 (0.79)	.32 (.12)	.014	1.95 (0.79)	.32 (.12)	.014	-	-	-
e: Support (6m) \rightarrow Dep (6m)	-0.02 (0.01)	-.15 (.05)	.007	-0.02 (0.01)	-.15 (.05)	.007	-	-	-
f: Enquiry (6m) \rightarrow Dep (6m)	1.27 (0.06)	.11 (.06)	.057	1.27 (0.06)	.11 (.06)	.057	-	-	-
g: Self-efficacy (12m) \rightarrow Dep (12m)	-0.32 (0.07)	-.42 (.08)	<.001	-0.32 (0.07)	-.42 (.08)	<.001	-	-	-
h: Group \rightarrow Dep (6m)	-1.07 (0.46)	-.23 (.10)	.019	-1.03 (0.53)	-.22 (.11)	.051	-	-	-
b*e: Group \rightarrow Support (6m) \rightarrow Dep (6m)							-0.29 (0.14)	-.06 (.03)	.032
c*f: Group \rightarrow Enquiry (6m) \rightarrow Dep (6m)							0.25 (0.15)	.05 (.03)	.098
i: Dep (6m) \rightarrow Dep (12m)	0.35 (0.06)	.35 (.07)	<.001	0.35 (0.06)	.35 (.07)	<.001	-	-	-
j: Group \rightarrow Dep (12m)	-1.75 (0.50)	-.37 (.10)	<.001	-0.76 (0.37)	-.16 (.08)	.038	-	-	-
d*g: Group \rightarrow Self-efficacy (12m) \rightarrow Dep (12m)							-0.62(0.28)	-.13 (.06)	.022
h*i: Group \rightarrow Dep (6m) \rightarrow Dep (12m)							-0.36 (0.19)	-.08 (.04)	.064
b*e*i: Group \rightarrow Support (6m) \rightarrow Dep (6m) \rightarrow Dep (12m)							-0.10 (0.05)	-.02 (.01)	.035
c*f*i: Group \rightarrow Enquiry (6m) \rightarrow Dep (6m) \rightarrow Dep (12m)							0.09 (0.06)	.02 (.01)	.114

Note. B = Unstandardized B coefficient; β = standardised beta coefficient; SE = standard error; 6m = six months; 12m = twelve months; Group = Intervention or comparison group (intervention group was coded as 1, and comparison group was coded as 0); Enquiry = whether WEAVE doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no); Support = how supported woman felt by WEAVE doctor in the past six months (rated on visual analogue scale); Self-efficacy = General Self-Efficacy Scale score; Dep = Depression score on Hospital and Anxiety Depression Scale.

^aEffects are presented as unstandardized B weights and standardized β weights, with standard errors in parenthesis, adjusted for outcome and mediation measures at baseline, Composite Abuse Scale at each time point, cluster (woman's doctor) and practice location. Where mediation is present the specific indirect effect is significantly different to zero.

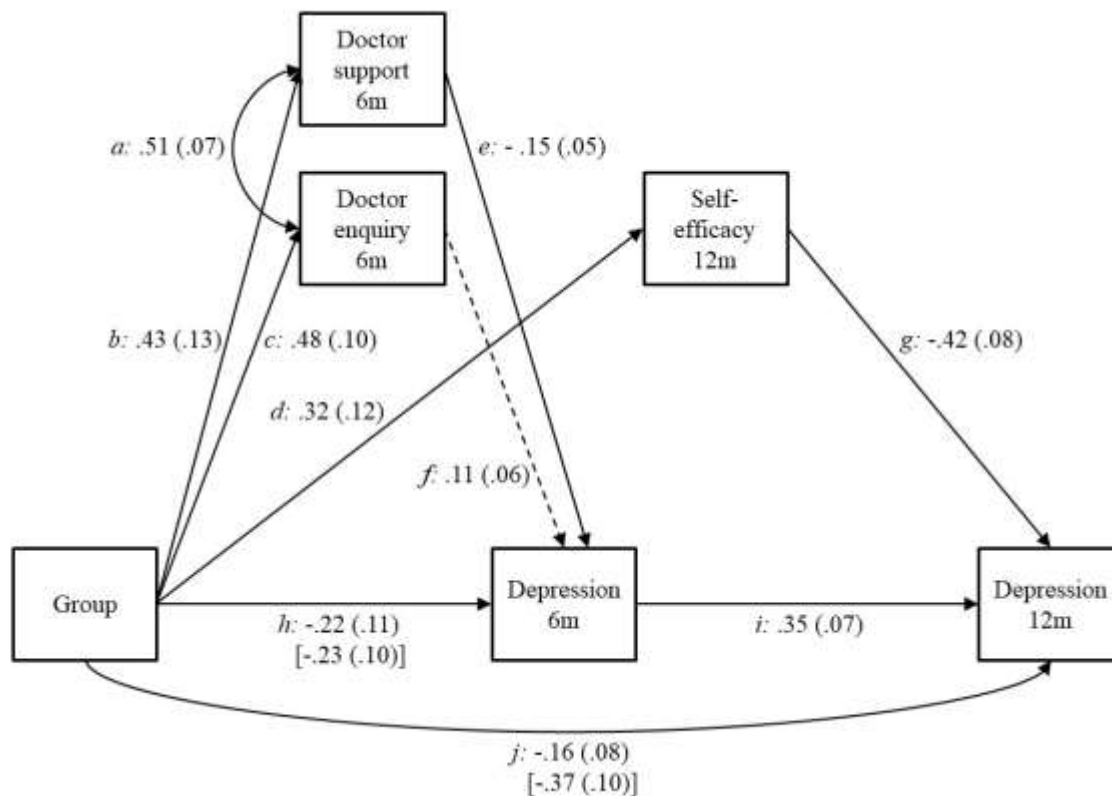


Figure 1. Model of paths from trial group to depression at six and twelve months for women experiencing fear of a partner ($n = 272$). Estimates in figure are standardised direct effects, with standard errors in round parenthesis. Where total effects are different to direct effects, these are given in square brackets. See Table 1 for all total, direct and indirect effects and significance levels in model.

Note. Group = Intervention or comparison group; 6m = six months; 12m = twelve months; Doctor support = how supported woman felt by trial doctor in the past six months (rated on visual analogue scale); Doctor enquiry = whether trial doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no); Self-efficacy = General Self-Efficacy Scale score; Depression = Depression score on Hospital and Anxiety Depression Scale. Dotted line represents a total effect not significantly different from zero (but that contributed to the model nonetheless).

Supplement

Previous WEAVE process evaluation papers

Thus far, the WEAVE process evaluations have included analysis of screening and baseline characteristics (1, 2), mixed-methods analysis of barriers and facilitators to attending the counselling intervention, drawing on the Theory of Planned Behaviour (3), exploration of participants' experiences of the intervention (3), and mixed-methods analysis of positive and negative consequences of trial participation (4).

Dates of recruitment and data collection

Doctors and their patients were recruited and randomised between 31 January 2008 and 18 June 2010. Six-month data collection occurred between 26 August 2009 and 24 June 2011, and twelve-month data collection between 18 March 2010 and 24 November 2011 (5).

Number of participants in intervention and comparison group who attended trial doctor

In total, 90 (66%) intervention group women attended at least one appointment with their WEAVE trial doctor between baseline and twelve months, with 23 (17%) attending five or more appointments (5, 3). For 67 (49%) of the intervention group women at least one of these appointments was a WEAVE counselling session (mean number of counselling sessions attended = 2.4, SD = 1.7, range = 1 to 6). Seventy-nine (59%) comparison group women attended at least one general appointment with their WEAVE trial doctor for usual medical care, with 22 (16%) attending five or more appointments.

Supplementary subgroup analyses

Supplementary, ad hoc subgroup analyses were conducted to assess effects when excluding women in the intervention who did not attend counselling. These supplementary analyses were conducted using the SUBPOPULATION command in MPlus Version 7 (6), and fitting the same path model as presented in the main text.

It was not possible to treat counselling attendance as a moderator variable in the current analyses, as there was no meaningful way in which to divide the comparison group into two equivalent subgroups. Hence the need to conduct this subgroup analysis separately.

Results for these supplementary analyses are reported in Table S1 (descriptive statistics) and Table S2 (total, direct and indirect effects for paths in the model), on the following pages. Effect sizes tended to be larger when excluding intervention group women who did not attend counselling. Supplementary analyses also showed that, when excluding counselling non-attenders from the intervention group, there was a significant association between group and doctor support at twelve-months, but not between doctor support and depression (Table S2). Hence, there was also no mediating effect of doctor support on depression for this subgroup at this timepoint.

Table S1. Descriptive statistics of outcomes, mediators and control variables when excluding women in the intervention group who did not attend counselling intervention (total n for this table = 202)

	Intervention				Comparison			
	n missing	n complete	n	(%)	n missing	n complete	n	(%)
Doctor enquiry about safety								
Baseline	1	66	10	(15.15)	2	133	19	(14.29)
6 months	16	51	28	(54.90)	39	96	12	(12.50) ^a
12 months	15	52	15	(28.85) ^b	36	99	11	(11.11) ^b
	n missing	n complete	Mean	(SD)	n missing	n complete	Mean	(SD)
Depression								
Baseline	1	66	8.11	(4.33)	1	134	7.65	(4.20)
6 months	15	52	6.06	(4.70)	37	98	6.95	(4.27)
12 months	14	53	5.83	(4.72)	36	99	7.63	(4.65)
Perceived support from doctor								
Baseline	3	64	62.17	(27.82)	5	130	60.90	(27.20)
6 months	18	49	73.96	(28.73)	43	92	35.35	(34.92)
12 months	15	52	74.08	(27.04)	39	96	67.13	(27.47)
Self-efficacy								
6 months	16	51	29.43	(5.88)	42	93	28.58	(5.52)
12 months	14	53	30.51	(6.15)	37	98	28.50	(6.10)
Composite Abuse Scale								
Baseline	1	66	20.58	(17.39)	3	132	18.49	(17.72)
6 months	15	52	11.79	(14.86)	41	94	11.38	(15.68)
12 months	16	51	12.02	(19.21)	39	96	10.01	(14.06)

Note. Doctor enquiry about safety = whether trial doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no); Perceived support from doctor = how supported woman felt by trial doctor in the past six months (rated on visual analogue scale from 0 to 100); Self-efficacy = General Self-Efficacy Scale score (not measured at Baseline); Depression = Depression score on Hospital and Anxiety Depression Scale. ^aWhen denominator only includes women who attended trial doctor between baseline and six months: Comparison = 18.03%; When numerator also includes women who told the doctor about their safety without first being asked: Intervention = 43 (82.69%), Comparison = 21 (33.87%). ^bWhen denominator only includes women who attended trial doctor between six and twelve months: Intervention = 34.09%, Comparison = 18.64%; When numerator also includes women who told the doctor about their safety without first being asked: Intervention = 31 (68.89%), Comparison = 23 (38.98%).

Table S2. Total, direct and indirect effects from trial group (intervention or comparison) to depression at six and twelve months, when excluding women in the intervention group who did not attend counselling intervention (total n for this table = 202)^a

Path	Total effect			Direct effect			Indirect effect		
	B (SE)	β (SE)	<i>p</i>	B (SE)	β (SE)	<i>p</i>	B (SE)	β (SE)	<i>p</i>
<i>a</i> : Support (6m) \leftrightarrow Enquiry (6m)	3.69 (1.2)	.33 (.09)	<.001	3.69 (1.2)	.33 (.09)	<.001	-	-	-
<i>b</i> : Group \rightarrow Support (6m) ^b	27.08 (5.96)	.74 (.16)	<.001	27.08 (5.96)	.74 (.16)	<.001	-	-	-
<i>c</i> : Group \rightarrow Enquiry (6m) ^b	0.26 (.08)	.59 (.17)	.001	0.26 (.08)	.59 (.17)	.001	-	-	-
<i>d</i> : Group \rightarrow Self-efficacy (12m)	2.53 (0.73)	.41 (.11)	<.001	2.53 (0.73)	.41 (.11)	<.001	-	-	-
<i>e</i> : Support (6m) \rightarrow Dep (6m)	-0.02 (0.01)	-.17 (.06)	.008	-0.02 (0.01)	-.17 (.06)	.008	-	-	-
<i>f</i> : Enquiry (6m) \rightarrow Dep (6m)	1.72 (0.72)	.17 (.07)	.018	1.72 (0.72)	.17 (.07)	.018	-	-	-
<i>g</i> : Self-efficacy (12m) \rightarrow Dep (12m)	-0.31 (0.08)	-.42 (.10)	<.001	-0.31 (0.08)	-.42 (.10)	<.001	-	-	-
<i>h</i> : Group \rightarrow Dep (6m)	-1.43 (0.47)	-.33 (.11)	.002	-1.36 (0.72)	-.31 (.16)	.056	-	-	-
<i>b*e</i> : Group \rightarrow Support (6m) \rightarrow Dep (6m)							-0.78 (0.30)	-.18 (.07)	.009
<i>c*f</i> : Group \rightarrow Enquiry (6m) \rightarrow Dep (6m)							0.71 (0.34)	.16 (.08)	.036
<i>i</i> : Dep (6m) \rightarrow Dep (12m)	0.36 (0.08)	.34 (.08)	<.001	0.36 (0.08)	.34 (.08)	<.001	-	-	-
<i>j</i> : Group \rightarrow Dep (12m)	-2.29 (0.55)	-.49 (.11)	<.001	-0.98 (0.46)	-.21 (.10)	.034	-	-	-
<i>d*g</i> : Group \rightarrow Self-efficacy (12m) \rightarrow Dep (12m)							-0.80 (0.33)	-.17 (.07)	.011
<i>h*i</i> : Group \rightarrow Dep (6m) \rightarrow Dep (12m)							-0.50 (0.30)	-.11 (.06)	.099
<i>b*e*i</i> : Group \rightarrow Support (6m) \rightarrow Dep (6m) \rightarrow Dep (12m)							-0.28 (0.11)	-.06 (.03)	.016
<i>c*f*i</i> : Group \rightarrow Enquiry (6m) \rightarrow Dep (6m) \rightarrow Dep (12m)							0.26 (0.15)	.06 (.03)	.077
Group \rightarrow Support (12m) ^c	7.62 (2.99)	.28 (.11)	.011	7.62 (2.99)	.28 (.11)	.011	-	-	-
Group \rightarrow Enquiry (12m) ^c	0.17 (0.06)	.45 (.16)	.004	0.17 (0.06)	.45 (.16)	.004	-	-	-

Note. B = Unstandardised B coefficient; β = standardised beta coefficient; SE = standard error; 6m = six months; 12m = twelve months; Group = Intervention or comparison group (intervention group was coded as 1, and comparison group was coded as 0); Enquiry = whether WEAVE doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no); Support = how supported woman felt by WEAVE doctor in the past six months (rated on visual analogue scale); Self-efficacy = General Self-Efficacy Scale score; Dep = Depression score on Hospital and Anxiety Depression Scale. ^aEffects are presented as unstandardised B weights and standardised β weights, with standard errors in parenthesis, adjusted for outcome and mediation measures at baseline, Composite Abuse Scale at each time point, cluster (woman's doctor) and practice location.

Where mediation is present the specific indirect effect is significantly different to zero. ^bPaths from group to doctor support at six months were fitted separately for this analysis due to inflated standardised estimates; these paths remain significant when comparison group only includes women who visited trial doctor. ^cDoctor support and doctor enquiry at twelve months were excluded from the overall mediation model as they had no significant relationship with depression, and therefore did not contribute to any mediation effects in the model; effects for these two paths are reported here for comparison with effects reported for the full sample in the main text.

Further explanation of statistical suppression in the model

Statistical suppression can occur when three variables are associated with each other but one of the associations is negative whereas the other two are positive (7). As an example, consider a situation where x is **negatively** associated with y , while a third variable, c , is **positively** associated with both x and y (Figure S1, diagram i). As a result, the direct path from x to y is negative, whereas the indirect path from x to y , via c is positive. If c is not controlled for in the model, the indirect, positive path will obscure the direct, negative path (Figure S1, diagram ii). Adjusting for the positive variance associated with c , by including c in the model, allows the negative, direct effect from x to y to be clearly estimated (Figure S1, diagram iii). In some models, suppression can exist even when not all paths in the model are statistically significant (7).

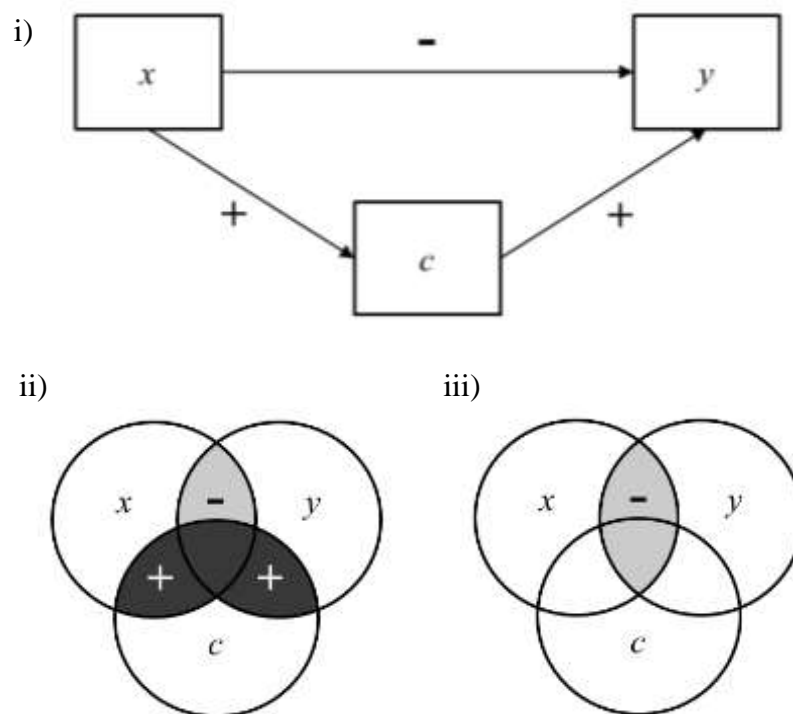


Figure S1. Diagrammatic example of statistical suppression

i) Example of path where statistical suppression is present. The direct path from x to y is negative, however the indirect path from x to y , via c is positive. The indirect, positive path will need to be controlled for in the model, so that the direct, negative path can be clearly estimated.

ii) The positive variance c shares with x and y may obscure the negative association between x and y .

iii) When positive variance associated with c is controlled for, the negative association between x and y becomes clearer.

In the current model, at six months, doctor support had a negative association with depression. However, doctor enquiry had a positive association with both doctor support and depression (see paths e , a and f , Figure 1 and Table 1). This created a statistical suppression effect whereby the trend toward a positive relationship between doctor enquiry and depression obscured the negative relationship between doctor support and depression (Figure S2, diagram i). This was overcome by controlling for doctor enquiry in the model at six

months, allowing the negative association between doctor support and depression to be observed (Figure S2, diagram ii). In other words, doctor enquiry was included in the model as a suppressor variable, defined as “a variable which increases the predictive validity of another variable (or set of variables) by its inclusion in a regression equation...” (8).

When allowing free estimation of parameters in the model, the bidirectional association between doctor enquiry and depression at 6 months was positive and statistically significant ($\beta = .12, p = .047$). This suggests that doctors were more likely to ask about safety if the patient was experiencing depressive symptoms. However, controlling for doctor enquiry as a suppression variable required specification of a unidirectional path from doctor enquiry to depression in the model, rather than free estimation of a bidirectional path (7). Although this unidirectional path did not reach statistical significance (Table 2, main text), its inclusion was necessary to allow clear estimation of the direct effect between doctor support and depression (Figure S2).

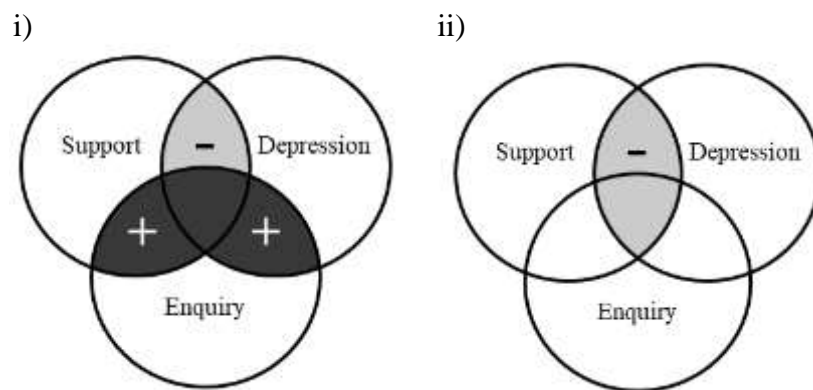


Figure S2. Simplified diagrams illustrating statistical suppression in the WEAVE path model at 6 months

ii) When not controlling for doctor enquiry, the positive variance doctor enquiry shared with doctor support and depression obscured the negative association between doctor support and depression.

iii) When positive variance associated with doctor enquiry was controlled for, the negative association between doctor enquiry and depression became clearer.

Notes. Support = how supported woman felt by WEAVE doctor in the past six months (rated on visual analogue scale); Enquiry = whether WEAVE doctor asked woman about her safety in the past six months, as reported by the woman (binary variable: yes/no); Depression = score on Hospital and Anxiety Depression Scale.

This figure is for illustrative purposes only, and does not attempt to represent actual proportions of shared and unique variance, nor the complexity of regression analysis. Theoretically, a negative association cannot be represented using a Venn diagram.

Further examination of GSES score differences in relation to GSES content

When accounting for clustering effects, stratification and control variables, there was a two-point mean difference between groups on the GSES (see Table 2, main text). This difference should be viewed in the context of the GSES being a relatively short scale (10 items), with only four response options available on each item (four-point Likert scale from 1 = “Not at all true” to 4 = “Exactly true”) (28).

Below are some examples of what a two-point difference on the GSES could represent, in terms of item content. A two-point difference on the GSES could be equivalent to the difference between:

- agreeing versus disagreeing with the item, “I can always manage to solve difficult problems if I try hard enough” (i.e. response of “exactly true” versus “hardly true” or “moderately true” versus “not at all true”);
- agreeing versus disagreeing with the item, “I am confident that I could deal efficiently with unexpected events” (i.e. response of “exactly true” versus “hardly true” or “moderately true” versus “not at all true”);
- responding “moderately true” instead of “hardly true” to both of the above two items.

Taking these examples further, it is conceivable that feeling able, rather than unable, to solve difficult problems or deal with unexpected events could have real-life implications for an IPV survivor’s wellbeing, even if holding all other responses constant.

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